

Applicant has rewritten all claims to overcome the improper form of Claims 11-12, 18, 23, 24 objected to under 37 CFR 1.75 (c) as being in improper form because they are multiple dependent claims; and accordingly as to MPEP 608.01 (n) claims 11, 12, 18, 23, 24 not further treated on the merits, and consequently claims 19-22 which individually depend from the improper multiple dependent claim 18 consequently not treated on the merit.

Accordingly, applicant submits that the claims are now in proper form and comply with 37CFR 1.75 and therefore requests withdrawal of this objection.

Claims 1-30 were rejected under 35 USC 112, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The terms “whereby” not defining structure; the term “sufficient width and length” as being indefinite; and further indefinite terms contained in Claims 1-30, and particularly cited for claims 2, 9, and 10 as being indefinite, and claims 11, 12, 18, 23, and 24 as being indefinite because of improper dependencies from multiple dependent claims and therefore not further treated on the merits and consequently claims 19 - 22 from multiple dependent claim 18 not further treated on the merit. Multiple dependent claims have been deleted and all claims rewritten to provide clarity and specificity in proper unambiguous form.

Also, applicant has rewritten all claims to define the invention more particularly and distinctly so as to overcome the rejections and define the invention definitely and patentably over the prior art.

Accordingly applicant submits that the claims do comply with 35 USC 112 and as to the discussion that follows and therefore requests withdrawal of this rejection.

The rejection of claims 1 - 3, 10, 14 - 17 under 35 USC 102 (b) as being fully anticipated

by Yabe is overcome.

The O.A. rejected claims 1 - 3, 10, 14 - 17 on Yabe. Claim 1 has been rewritten as new independent base claims 21, 26, and 34, to more fully clarify in regard to preferred embodiments what applicant means as “axially centered” rotor and stator winding alignment, as defined in the specification and shown in the drawings. New claims 21, 26, and 34 provide the basis of novelty, distinction, and non-obviousness that more clearly represent the invention. Subsequent dependent claims that were improper or confusing were deleted or rewritten to further distinguish patentability over the prior art. Applicant requests reconsideration of this rejection, as now applicable to amended claims 21, 26, and 34, and subsequent new dependent claims for the following reasons.

- (1) Yabe reference is a misunderstood reference.
- (2) Even if Yabe used at least one continuous coil winding to equip the stator surrounding his rotator, the device would be inoperative.
- (3) Yabe stator is not core-less.
- (4) Yabe does not suggest that his device be modified in any manner required to meet the claims.
- (5) Yabe does not anticipate applicant’s inventive structure and does not teach what the O.A. relies upon as supposedly teaching.
- (6) Yabe device teaches away from applicant’s inventive structure, is non-analogous art and solves a different problem as recited in both the specification and the claims.
- (7) The novel features of base claims 21, 26, and 34, produce new and unexpected results and hence are unobvious and patentable over the references.

The reference and differences of the present invention thereover.

Prior to discussing the claims and the above seven points, applicant will first discuss the reference and the general novelty of the present invention over the reference.

Yabe provides a mechanical voltage regulator by tilting a standard stator configuration out of a maximum output position with his permanent magnet rotor. Curved surfaces are provided for this movement of the stator body that is fixed to a worm wheel, worm drive, and stepper motor having a sensor and a control section. With few options available for this design, the rotator supported by a shaft is cantilevered through a bearing so that rotator can be positioned within stator from one side while allowing movement of worm wheel, connecting members, and control to be enacted on the other side without interference. The stator is constructed tiltable from a position of maximum output either by the additional second shaft pivot connected to the stator or alternately by a proposed but not shown “anchor ring-like slide guide” without enlarging equipment according to this invention, “since it constitutes so that the surrounding of the shaft which intersects a stator perpendicularly with the revolving shaft of a rotator may be rocked”.

Moreover, and aside from the many parts required for this construction and the narrowly limited uses for such, Yabe clearly defines and shows “the revolving shaft of a rotator and a stator cross at right angle rotatable according to this invention in order to attain the above-mentioned purpose”. Accordingly, as the stator is caused to skew in relation (Drawing 2), less output is produced. It would not be possible or anticipated in this construction for Yabe to use an armature winding of applicant’s construction that is parallel (not perpendicular) with the rotor axis.

Yabe reference is a misunderstood reference.

Yabe recites in specification, description, and drawings that his revolving shaft (10) of a rotator (1) and stator (2) are aligned perpendicular, “the revolving shaft of a rotator and a stator cross at right angles rotatable. At no position does Yabe show or desire an axially centered stator, as defined and shown by applicant, wherein at least one continuous coil winding conductor is axially centered and aligned such that winding follows a plane parallel to the geometric axis of the rotor.

Yabe provides an almost spherical shape rotator (1) and shaft (10) that permits the stator (2) inner surface to pivot within a range of motion limited by the shaft on one side and the limit range of motion limited on the other side by the section of a worm wheel (4) or actuator rod (18). These limits serve Yabe's purpose, as no further range of motion is necessary, required, or even possible as described and shown. Yabe's maximum output position is a rotator axis at right angle to surrounding plane of stator in contrast to the maintained parallel position of applicant's coil winding and rotor axis. The Yabe reference, in view of this distinction and additional reasons that follow, is a misunderstood reference and does not teach what examiner relies upon it as supposedly teaching. Applicant's invention is contrary to the teaching of the reference and would require a strained interpretation made only by hindsight.

Even if Yabe used at least one continuous coil winding to equip the stator surrounding his rotator, the device would be inoperative.

The overall configuration of Yabe armature winding (22) equipped upon stator core body (20) with extended core piece (21) is not exactly specified and is unclear. It is probable and most likely that his stator employs at least two or a series of armature windings spaced about the stator.

Yabe's rotator shaft being at right angle to a surrounding stator body is not new. Most alternators and motors are arranged as such. One would naturally assume, and since Yabe has not indicated otherwise, that his stator is equipped with several armature windings mounted to cores while surrounding the rotator, given that few alternatives would be possible by such structure.

Accordingly there is no reason to assume by hindsight that the basic magnetic circuit is different from standard practices in the art other than his allowance of the stator to tilt out of a position of optimal output by providing shaped surfaces for such movement. The novelty and success of his structure allows a modified but known stator to be moved away from the maximum output position for limiting output as condition response to increase in velocity.

If Yabe used applicant's bobbin-type stator with a continuous single coil winding following in

plane around the bobbin, not only would the axis of rotor rotation remain totally different from applicant's rotor axis position in relation to stator, but such a Yabe device would be inoperative according to the laws of induction, as his optimal position of greatest output shown in Yabe figure 1 would produce no current whatsoever.

Yabe stator is not core-less.

Yabe drawings show example of a stator core (20) and extended core piece (21), with armature winding (22); while applicant coil winding, following and supported by bobbin that is hollow through, is technically considered core-less, except that applicant's rotor can be considered as a rotatable core of the at least one continuous coil winding. This important distinction speaks not only to omission of an element in Yabe but further emphasizes contrast of structure and novelty while showing unobviousness.

Yabe does not suggest that his device be modified in any manner required to meet the claims.

Yabe's use of a second shaft (11) for limited pivot range of his stator connected to a worm wheel or an actuator rod is necessary and integral to his novel mechanical structure.

Of the various alternatives suggested by Yabe to achieve his goals, Yabe does not suggest or show that his rotator could operate without a shaft, whereas applicant preferred embodiment rotor operates without any shaft whatsoever. Also, Yabe does not suggest or show that his rotator be magnetically coupled to a moving or rotatable magnet or electro-magnet additionally located externally to a stator.

Yabe does not anticipate applicant's inventive structure and does not teach what the O.A. relies upon as supposedly teaching.

Yabe provides a mechanical solution to a problem that is often solved by standard electronic

circuits. Example is given by Yabe in terms of the large variations of acceleration that occur with an alternator connected to a car motor “in order to hold down output voltage to a fixed range, the method of restricting an output electrically have been used conventionally”. Yabe does not provide an improved alternator design per se, but mechanically limits the output of a basic alternator structure.

Also, the minimum number of parts necessary to operate Yabe device is eight, and this is without the further necessary parts (5), (12), and (13) to sense and change the mechanical positions while further conditioning the output. In contrast, applicant’s device operates efficiently and robustly, albeit for a different purpose, with only four parts. For these and other reasons, Yabe would not anticipate applicant’s structure and does not teach what the O.A. relies upon as supposedly teaching.

Yabe device teaches away from applicant’s inventive structure, is non-analogous art and solves a different problem as recited in both the specification and the claims.

Further, by overall comparison, Yabe teaches away from applicant’s inventive structure.

Applicant does not attempt to reduce or limit output and Yabe does not teach structure to increase basic performance output of a generator or alternator, but oppositely to reduce it. In view of this, Yabe would have no reason to also provide magnetically coupled or additional grouping of devices that would cooperatively add even more output, as described and shown by applicant. Also, Yabe does not show or suggest that a device be wholly contained and waterproof in a structure or device without a shaft penetration. Yabe would therefore have no reason to anticipate or make obvious applicant’s device. Applicant’s invention solves a different problem as recited both in the specification and the claims. In re Wright, 6 USPQ 2d 1959 (1988); and shows a non-analogous art.

The novel features of base claims 21, 26, and 34, produce new and unexpected results and

hence are unobvious and patentable over the references.

Applicant's dynamo-electric device achieves a different purpose than Yabe and provides an easily scalable, robust output design with few parts that is applicable to a large range of products. The present invention can perform by alternate embodiments with or without a rotor shaft whatsoever, can be directly connected or magnetically coupled to external drive in contact-less manner and at various selectable orthogonal drive alignments, can be grouped in modular form for greater outputs, and can be easily waterproofed without shaft penetration while maintaining a rotor axis that is parallel (not perpendicular) to the stator coil winding.

Applicant therefore submits that Yabe structure and embodiments do not anticipate or show obvious applicant's dynamo-electric device, that rejection is not justified or proper; and submits that the rejection on this reference should be withdrawn.

Applicant respectfully requests, if the claims are again rejected upon the reference, that the Examiner include an explanation, in accordance with M.P.E.P. to support such rejection.

Applicant's new independent base claims 21, 26, and 34 provide the novelty and scope of disclosed embodiments in specification and shown in the drawings.

Claim 21 distinguishes the proper structure and orientation of applicant's rotor, axis, and coil winding without specifying the use or non-use of a rotor shaft, provides a core-less stator including pivotal support means for the rotor as broadly selectable from various methods, and generally provides rotor means wherein the rotor is urged to rotate, such means being selectable from both known means and those further provided by applicant in subsequent dependent claims.

Claim 26 also distinguishes the proper structure and orientation of applicant's rotor, axis, and coil winding while particularly providing the rotor and stator with a shaft for pivotal support means,

while generally providing rotor means for urging rotation as selectable from subsequent dependent claims.

Claim 34 distinguishes the proper structure and orientation of applicant's rotor, axis, and coil winding while particularly providing the spherical rotor without a shaft, providing a stator enclosure to contain the rotor with pivotal support particularly provided by the introduction of magnetic fluid in the air gap dimension that provides a hydrostatic pressure gradient along the entire spherical surface area of the rotor and the along the inside spherical surface areas of the cavity containment walls for suspension of the rotor having no shaft. Rotor alignment means is generally provided wherein the rotor is aligned in proper orientation with coil winding, and rotor means is generally provided wherein rotor is urged to rotate about said axis.

The new dependent claims are also and therefore patentable over Yabe and the other references.

Claim 23 recites to claim 21, providing a member attached to the permanent magnet rotor extending laterally through the unobstructed side of stator bobbin. Such member can be utilized either as rotor means for urging the pivot rotation as applicable to motion conversion or may be utilized as a reciprocating out-take from an energized coil. Fig.14 (71).

This, of course, would have no purpose in a Yabe design.

Claim 24 separately recites to claim 21 the same member attached while providing additional travel limit abutment for extended member. Fig.14.

Claim 25 provides the extended member of claim 23 and further provides an adjacent, magnetically coupled and pivotally mounted magnet having its own extended member for extended relative travel between the two members. Fig.15.

Claim 27 recites to claim 26 rotor means with additional and externally provided, magnetically coupled, moving magnet for urging rotation of rotor. Generally described magnet anticipates numerous ways an external magnet could activate the rotor, for instance in motion conversion devices. Fig.12 and 13.

Claim 28 recites to claim 26 similarly but separately and specifically to magnetic coupling with an external, axially rotatable magnet. Fig.10 (A),(B),(C), and (D).

Claim 29 recites to claim 26 wherein rotor means includes an additional and externally provided electromagnet. Not shown, but suggested in specification. Pg. 5,6,7.

Claim 30 recites to claim 26 with the addition of a ferrous or iron member proximal to stator for causing a bias position of the rotor. Pg.5 and 7.

Claim 31 recites to claim 26 and provides a grouping of two dynamo-electric devices of claim 26 for mutual cooperation and rotation, and generally includes connection means between them, as connection means may be direct physical coupling or magnetic coupling. This is also foreign to Yabe.

Claim 32 recites further to claim 31, specifically including magnetic coupling between the two devices.

Claim 33 recites further to claim 31, including an additional and external moving magnet for urging mutual rotation.

Claim 35 recites to claim 34 wherein said rotor alignment means includes an additional and

external positioned magnet.

Claim 36 recites to claim 34 wherein said rotor alignment means includes an additional and external moving magnet.

Claim 37 recites to claim 34 wherein rotor alignment means includes an additional and external rotatable magnet having an axis of rotation.

Claim 38 recites to claim 34 wherein rotor alignment means includes an additional and external ferrous or iron member magnetically coupled with the rotor.

Claim 39 recites to claim 34 wherein rotor means for rotation includes magnetic coupling with additional and external rotatable magnet having an axis of rotation.

Claim 40 recites to claim 34 wherein rotor means includes magnetic coupling with the permanent magnet of an additional and proximally mounted dynamo-electric device as broadly defined.

Applicant submits that dependent claims are also now in proper form and provide additional novelty and unobviousness. Accordingly applicant submits that the dependent claims are a fortiori patentable and should also be allowed.

Claims 4 - 9, 25 - 30 rejected under 35 U.S.C. 103 (a) as being unpatentable over Yabe, as applied in the rejection against the base claims, and in view of Nagai is overcome.

The O.A. rejected claims 4 - 9 and 25 - 30 as unpatentable over Yabe as to the base claims and in

view of Nagai. Applicant has amended cited claims as well as all claims to define the invention more particularly and distinctly so as to overcome technical rejections as well as specified rejections and define the invention patentably over the prior art. Claims 4 and 5 have been rewritten as new base claim 34. Claims 6 - 8 are rewritten generally inclusive in new dependent claim 22. Claim 9 is rewritten inclusive to new base claim 26. And claims 25 - 30 are deleted.

Applicant requests reconsideration of this rejection, as now applicable to amended claims 21, 26, 34, and all subsequent dependent claims for the following reasons.

- (1) References teach away and it would not be logical to combine them.
- (2) Those skilled in the art would find it impossible or extremely difficult to combine the references cited.
- (3) Even if combined, the references would not meet the claims.
- (4) With or without the Yabe reference, Nagai reference would not meet the claims.

References teach away and it would not be logical to combine them.

Nagai provides a magnetic substance having fluidity as filling the air gap between rotor and stator to increase flux density and improve efficiency, which directly corresponds to output. Yabe, contrarily, provides structure to reduce output as also directly corresponds to efficiency of output. It would not be logical to combine these two references. The references take mutually exclusive paths and reach different solutions to different problems. By implication each teaches away from combining itself with the other.

Those skilled in the art would find it impossible or extremely difficult to combine the references cited.

Yabe does not suggest or show that his device could use the magnetic fluid of Nagai, as to do so would require extensive or impossible modification of Yabe's stator requiring adequate space for

movement approaching the shaft of his rotator. There would be no way to both contain the fluid from spinning off while allowing the space for movement. The only other possibility might be for Yabe to fill the entire housing (8) with magnetic fluid; however, it is doubtful that the additional components within the housing including the gearing and the stepper motor would properly operate, notwithstanding the wasted volume and expense that would follow. Such combination is too involved to be considered obvious.

Even if combined, the references would not meet the claims.

Applicant's use of magnetic substance having fluidity is not suggested in embodiments where a shaft is utilized, although such could be done. Further, that Yabe has been overcome by the amended claims, the combination with Nagai would by implication show that the combined references would not meet the claims.

With or without the Yabe reference, Nagai reference would not meet the claims.

The magnetic fluid of Nagai is provided to enhance the output while applicant's use is to fully suspend a rotor without a shaft. Nagai's magnetic fluid provides limited support to his rotor and does not encompass the entire surface area of applicant's spherical permanent magnet suspended in a cavity without a shaft.

As to vibration damping, use of magnetic fluid to Nagai and other cited references, damping is only provided in limited planes of vibrational movement. A totally spherical shape having magnetic flux along the entire surface area is the only shape capable of direct damping in every direction, and such is not shown or anticipated by Nagai.

As described in applicant summary, various methods may be employed in combination with the invention to support or suspend the rotor within the stator, and such methods are possible as noted for a rotor that does not include a shaft. Such structure and methods are not suggested

where a shaft is used for such support, extended or not.

Additionally, O.A. included in rejection under 35 USC 103 (a) as to Yabe in view of Nagai, regarding recitation of the viscous substance is pneumatic, hydraulic, or magnetic pressure; as in claims 6 - 8, that it would be obvious to select a suitable viscous substance as a matter of obvious design choice. Claims 6 - 8 are rewritten in amended claims as generally included in claim 22 reciting spherical bearing means for rotation of said rotor about said axis. Yabe and Nagai do not suggest, show, or anticipate such means or combination. In particular, Yabe would not anticipate his rotator suspended entirely without a shaft and he would not further anticipate a means for both properly aligning such a rotator and means for urging rotation without direct physical connection. Even so, Yabe or Nagai would not meet the claims.

Also, regarding the shaft being not to extend beyond the stator coil, as rejected under 35 USC 103 (a) as in claim 9, that it would be obvious to modify the size or length of the shaft for suitable accommodating within the housing of the device. Claim 9 is rewritten as included in amended claim 26 wherein stator and rotor are provided with a fixed shaft and bearing for rotation in proper construction and alignment as distinctly recited.

Further regarding rejection of claims 26 - 30 that apparatus claims must be structurally distinguishable from the prior art. Claims 26 - 30 are deleted in amended claims as generally inclusive by inference in the base claims.

Accordingly applicant submits that the additional rejections on the references be withdrawn.

Applicant therefore submits that combining Yabe and Nagai, or to Nagai viewed separately, as anticipating or obvious to applicant's invention is not justified or proper. Thus applicant submits that rejection on the references be withdrawn.

Also, applicant has reviewed additional cited but not applied references provided by examiner but reference does not show applicants invention or render it obvious.

Applicant respectfully requests, if the claims are again rejected upon the references, that the Examiner include an explanation, in accordance with M.P.E.P. to support such rejection.

Conclusion

For all the above reasons, applicant submits that the claims are now in proper form, and that the claims all define patentably over the prior art. Therefore applicant submits that this application is now in condition for allowance, which action applicant respectfully solicits.

Conditional Request For Constructive Assistance

Applicant has amended the claims of this application so that they are proper, definite, and define novel structure which is also unobvious. If, for any reason this application is not believed to be in full condition for allowance, applicant respectfully requests the constructive assistance and suggestions of the Examiner pursuant to M.P.E.P. 706.03 (d) and 707.07 (j) in order that the undersigned can place this application in allowable condition as soon as possible and without the need for further proceedings.

Very respectfully,

Applicant Johnny Long

Johnny Long
3305 Tazewell Pike, Apt.1
Knoxville, Tennessee 37918-2521



Appn. Number 10/733,519

(Long)

GAU 2834

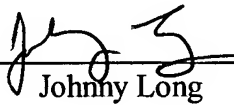
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Date



Johnny Long